Germ-line genetic engineering: a critical look at Magisterial Catholic teaching

David Albert Jones

Director, The Anscombe Bioethics Centre, Oxford

Abtract

This article is written from within the Catholic, and more particularly the Augustinian/ Thomist tradition of moral theology. It analyses the response of the Catholic Magisterium to the prospect of germline-genetic engineering (GGE). This is a very new issue and the Church has little definitive teaching on it. The statements of Popes and Vatican congregations or commissions have not settled the key questions. An analysis of theological themes drawn from secular writers points beyond pragmatic safety considerations towards intrinsic ethical limits to GGE. Given the impossibility of identifying would-have-been-created persons who would be 'treated' by this intervention, altering the human genome for the sake of future generations cannot be regarded as 'therapy'. Further theological considerations suggest that GGE may not be morally permissible, even in the case of identifiable genetic diseases. This is an area where more theological reflection is needed.

Key words

(1) Germ-line, (2) genetic, (3) theology, (4) ethics, (5) Magisterium

Germ-line genetic engineering: a critical look at current Roman Catholic teaching

This article is written from within the Roman Catholic, and more particularly the Augustinian/ Thomist tradition of moral theology. It acknowledges the authority of teaching office of the Roman Catholic Church, sometimes termed the 'Magisterium'. This is constituted by the bishops of the Church in communion with the bishop of Rome. On some specific matters of faith and morals, the Magisterium has settled definitively the limits of orthodox doctrine. The obvious examples of this are the creeds of the ancient Church. On matters that are not as yet defined doctrine (*de fide*) the current teaching of the Magisterium remains weighty and worthy of respect. However, it may be mistaken in some respects and may need to develop through internal theological criticism.

The ethics of germ-line genetic engineering (GGE) is a case in point. This is a very new issue and the Church has little definitive teaching on it. The present paper aims to demonstrate that GGE demands a more thorough-going theological analysis than has yet occurred within the Catholic community. Two theological themes are then explored that suggest intrinsic ethical limits in this area and not only pragmatic safety considerations. The work of serious Catholic theological reflection on GGE has hardly begun, but the preliminary considerations presented in this paper suggest that altering the human genome for the sake of future generations is inherently morally unacceptable, even in the case of identifiable genetic diseases.

1. Unease among the nations

The prospect of GGE has engendered widespread unease. One commentator has even gone so far as to characterise it as a 'potential weapon of mass destruction' (Annas et al 2002, p. 173). It is an issue that poses 'unprecedented concerns' (Andorno 2002) for the human race: For it has the potential to reshape the human species as a whole. There are a number of 'transhumanists' who are explicitly in favour of seeking to transform humanity into a new and better species, a superman. While a few are attracted to this dream, to most people the clear echoes of Nazi eugenics make it an appalling vision, and it is perhaps for this reason that a number of countries and international bodies have prohibited absolutely all attempts at GGE.

This issue was first debated at a European level in relation to biotechnology patents. An attempt to extend patent protection for biotechnology in 1988 foundered in the European parliament because it did not include ethical limits. When the proposed directive was reintroduced in 1995 it succeeded only because certain areas were explicitly excluded from patentability. These included:

Processes for the modifying the germ line genetic identity of human beings (Article 6, 2 (b))

At the same time as the European Parliament and the Council of Ministers were discussing GGE in relation to patentability, a different European body, the Council of Europe was drawing up a *Convention on Human Rights and Biomedicine*. This was opened for signing in 1997. It included the following article on genetic engineering in humans:

Article 13. An intervention seeking to modify the human genome may only be undertaken for preventive, diagnostic or therapeutic purposes and only if its aim is *not to introduce any modification in the genome of any descendants*. [emphasis added]

Note that this article allows gene therapy on an existing person for the sake of prevention, diagnosis or treatment of disease (so called 'somatic gene therapy'). What is expressly prohibited is any attempt to introduce a modification in the genes of future persons. This is prohibited even when the modification aims at the prevention of disease. Existing persons may be treated but future persons are not to be reshaped even for the sake of their own health.

The same year as the European Convention was opened for ratification, the general conference of the United Nations Science and Cultural Organisation (UNESCO) endorsed a *Universal Declaration on the Human Genome and Human Rights*. This identifies 'germ-line interventions' as practices that 'could be contrary to human dignity' (Article 24).

In addition to these international moves, a number of nation states, including France, Germany, India, South Korea, and South Africa have enacted national legislation to prohibit GGE. (IBHF 2009)

There is thus an impressive list of international instruments and national legislation opposing GGE. However it should be noticed that the UNESCO declaration has no legal force and, in any case, it does not prohibit or even condemn the practice unequivocally. The declaration only suggests that

this is one area that '*could be* contrary to human dignity' [emphasis added] so that UNESCO requires further guidance from its International Bioethics Committee. The directive on patentability may inhibit investment into certain areas of biotechnology but it does not prohibit the development of such technologies. In contrast, the Council of Europe's Convention on Human Rights and Biomedicine is legally binding for those who ratify it, and to date it has been ratified by twenty-six countries. It remains the most significant international instrument prohibiting GGE.

In some countries (such as Belgium) there is an explicit prohibition on clinical interventions of a 'eugenic 'kind. However, these are defined as 'the selection or amplification of *non-pathological* genetic characteristics' [emphasis added]. The same distinction is made in the UN Declaration where it is said that 'research affecting his or her genome may only be carried out for his or her direct health benefit'. Hence, interventions of direct health benefit, to prevent pathological genetic characteristics, are effectively permitted. The Belgian legislation is intended to support the practice of embryo selection (Pre-implantation Genetic Diagnosis) for pathological genetic conditions. However, the same logic would seem to support GGE for the same conditions, if this could be done safely.

In the United Kingdom the genetic selection of embryos is permitted under licence from the Human Fertilisation and Embryology Authority. The current law (Human Fertilisation and Embryology Act 2008, section 3ZA (5)) prohibits the implanting into a woman of a human embryo that has been genetically modified. However, there is no prohibition on genetically modifying human embryos for research purposes, if this is done under licence and the embryos are not implanted. Furthermore, implantation of a genetically modifying human embryos could be licenced if this is to address mitochondrial disease. Thus GGE to avoid these conditions is legal, in principle, in the UK.

Even among those countries that have prohibited all GGE or the creating of genetically modified human embryos for all purposes, several have done so explicitly for reasons of safety and 'in the present state of knowledge' (South Africa, and similarly India). By implication, as science and technology make progress and safety fears are ameliorated then GGE will become more acceptable.

The state of international law and public policy in this area is thus not uniform. On the one hand there are very widespread concerns about the potential of this technology to be abused and there is a near universal consensus that, at present, the technology is not safe. Nevertheless, this consensus is compatible with a conditional acceptance of the technology if and when it becomes safe, and the United Kingdom has already made legal provision for GGE for mitochondrial disease. On the other hand there seems to be a feeling among some people, strong in some countries but not universal shared, that there is a deeper, intrinsic, problem with GGE. The UNESCO declaration alludes to this in asking whether GGE might be 'contrary to human dignity'. Nevertheless, governments and courts have struggled to articulate the alleged character of this deeper objection and it has not found general support. In most countries of the world, including the United Kingdom and the United States, the legal position on GGE is based primarily on safety concerns reflecting the current state of research rather than on intrinsic ethical difficulties.

2. The banal conventionality of official Catholic teaching in this area

People who feel uneasy in relation to some new technology may well turn to religious perspectives, including that of the Catholic Church for an account of what, if anything, is supposed to be ethically problematic about it. However, an interested outsider or a Catholic who has misgivings about GGE will find very little that is original or interesting in the scattered official Catholic responses to the question. This is in contrast to questions about human sexuality, the body, or the inviolability of human life where the Magisterium has developed a rich theology rooted in the Scriptures and in the tradition. The Catholic Church, especially under John Paul II, has endeavoured not only to defend the institution of marriage and the sanctity of human life but has sought to deepen these issues by reflecting on what it is to be 'one flesh' with another person (Genesis 2.24) and what it is to be made in the 'image of God' (Genesis 1.27).

In relation to genetic engineering such Scriptural and theological reflections are conspicuous by their absence.[i] Instead, Magisterial documents typically set out the conventional distinction between somatic and germ-line gene therapy and then express great caution about the latter. However, the

reason for this caution is nothing more than the oft repeated safety worries related to the current state of scientific research. For example, the 2009 document on bioethical issues, *Dignitas Personae*, makes the following statement:

'The moral evaluation of *germ line cell therapy* is different. Whatever genetic modifications are effected on the germ cells of a person will be transmitted to any potential offspring. Because the risks connected to any genetic manipulation are considerable and as yet not fully controllable, *in the present state of research, it is not morally permissible to act in a way that may cause possible harm to the resulting progeny.* In the hypothesis of gene therapy on the embryo, it needs to be added that this only takes place in the context of *in vitro* fertilization and thus runs up against all the ethical objections to such procedures. For these reasons, therefore, it must be stated that, in its current state, germ line cell therapy in all its forms is morally illicit.' (*Dignitas Personae* para 26)

The first three sentences of this paragraph are so conventional they could have been taken from any number of national or international statements on this issue. Indeed they are strikingly similar to the law enacted by India in 2001 'Considering the present state of knowledge, germ-line therapy in humans shall be proscribed' or that of South Africa in 2002: 'There is, at present, insufficient knowledge to evaluate the risks, to future generations, of gene modification of the germ line. It is therefore recommended that gene modification of the human germ line should not yet be attempted.'

The next two sentences are distinctive of recent Catholic teaching in bioethics, in that they express ethical criticisms of in vitro fertilisation (not made explicit in this paragraph but stated elsewhere in the same document). These criticisms refer first to the destruction of human embryos in the development and practice of IVF, and secondly to the way in which IVF takes place in the laboratory and circumvents rather than assists the sexual union of the couple. On the face of it neither of these points directly addresses the issue of whether there is something intrinsically wrong with seeking to control the genotype of a future person. In the absence of any such account the default seems to be that there is no essential difference between somatic and germ-line intervention and there would be

no ethical objection to GGE if this could be achieved safely, without destroying embryos and without the need for in vitro fertilisation.

On the basis of this document it has been argued that 'should the current state change in the following two respects, 1) risks to progeny are reduced so as to be outweighed by likely therapeutic benefits, and 2) the subjects involved in the germ line therapy (either gametes or early stage embryos) do not affect persons coming into existence through a morally licit act (the conjugal act between a husband and wife), the [Catholic] Church's position on germ line therapy would likely be that it is morally permissible.' (Delaney 2009, p. 33) This last practical condition is imaginable in principle, for example, if the focus of gene therapy were the gamete-producing tissues – the testes or ovaries – with conception then occurring through sexual intercourse, without the use of IVF.

The conditional acceptance of GGE in contemporary Catholic moral theology is made explicit in a document of the International Theological Commission. This body is not strictly speaking as an element of the Church's Magisterium. Individual Catholics are not bound by its expressions of opinion. Nevertheless, where the commission has published a view on the Vatican's own website and where this has not been criticised or corrected by the Magisterium then it can reasonably be understood as expression of Catholic belief that is acceptable to the Magisterium. On GGE the commission made the following statement:

'Germ line genetic engineering with a therapeutic goal in man would in itself be acceptable were it not for the fact that is it is hard to imagine how this could be achieved without disproportionate risks especially in the first experimental stage, such as the huge loss of embryos and the incidence of mishaps, and without the use of reproductive techniques. A possible alternative would be the use of gene therapy in the stem cells that produce a man's sperm, whereby he can beget healthy offspring with his own seed by means of the conjugal act.' (para 90)

Nevertheless, this statement, and Delaney's reading of *Dignitas Personae*, appears to be in some tension with a statement in an earlier Magisterial document, *Donum Vitae*:

'*Certain attempts to influence chromosomic or genetic inheritance are not therapeutic but are aimed at producing human beings selected according to sex or other predetermined qualities. These manipulations are contrary to the personal dignity of the human being and his or her integrity and identity.* Therefore in no way can they be justified on the grounds of possible beneficial consequences for future humanity. Every person must be respected for himself: in this consists the dignity and right of every human being from his or her beginning.' (para 1.6 emphasis in the original)

This declaration presupposes but does not explore an alleged link between genetics and the integrity and identity of the human person. The basis of this link and its relevance to theology will be examined later in this paper. This passage from *Donum Vitae* is invoked in the Universal Catechism: '"Certain attempts to *influence chromosomic or genetic inheritance* are not therapeutic but are aimed at producing human beings selected according to sex or other predetermined qualities. Such manipulations are contrary to the personal dignity of the human being and his integrity and identity" which are unique and unrepeatable.' (2275 emphasis in the original)

One way to read this paragraph is as an absolute prohibition of GGE, on the basis that such interventions are not in themselves therapeutic, because they are not directed at living patients but at producing future persons with predetermined qualities. However the paragraph can also be read as referring only to manipulations concerned with 'predetermined qualities' that are non-pathological, as in the Belgian legal definition of 'eugenic' interventions. This reading is supported by the document's reference to the sex of the child as a prohibited criterion of selection. The attempt to correlate *Dignitas Personae* with *Donum Vitae* thus shows up an ambiguity in the earlier teaching. Did it intend to condemn all GGE or only that directed towards the eugenic selection of predetermined qualities (other than the correction of pathological conditions)?

When one moves from the Magisterium to discussions by Catholic theologians a similar ambiguity is often present. A document by the working party of the Catholic Bishops Joint Committee on Bioethical Issues, working under the bishops of England and Wales, Ireland, and Scotland, was unable to identify any intrinsic problem with GGE. The report based its objections to GGE on the

involvement of in vitro fertilisation, the concomitant destruction of human embryos, and the risks of genetic engineering for patients, given the current state of knowledge. 'In principle such acceptable treatments could include germ-line gene therapy; however, in practice, germ-line therapy is likely to involve one or more of various morally unacceptable elements: use of in vitro fertilization or similar techniques, experimentation on embryos in the course of developing the therapy, discarding of embryos and abortion of foetuses on whom the therapy is unsuccessful, and the causing of excessive risks to the subject and to his or her descendants.' (CBJCBI p. 42-43)

Another document reflecting the views of Catholic theologians on this issue was the 2007 agreed statement of the International Association of Catholic Bioethics. According to this document:

'Gene therapies that affect or may affect the germ line or the reproductive cells of human beings, and have an impact on future generations, should not be pursued.' (IACB 17c, p. 333)

It is noteworthy that this bald assertion includes no rationale and no indication as to whether the prohibition is intended as something provisional, based on the precautionary principle and given the current state of research, or whether it is based on an intrinsic moral problem. A footnote indicates that at the meeting there was disagreement among theologians as to whether 'an exception could be made if it were technically feasible to correct lethal genetic disorders like trisomy 18' (footnote 12, p. 333). This was admittedly of no immediate practical relevance, given the current state of knowledge, 'but, in the future, [it] could be an emerging topic of discussion' (p. 327). The fact that this was debated shows that at least some theologians present were supportive of GGE to prevent lethal genetic conditions, if this could be done safely and without the harms associated with IVF. On the other hand it also seems that some Catholic theologians present would not endorse GGE even in such a case. The 'emerging topic of discussion' is precisely whether there is an intrinsic moral problem such as would exclude GGE even when this would aim to prevent some clearly pathological condition.

From a theological perspective what is perhaps most striking about all the responses to genetic engineering by the Magisterium and by some groups of Catholic theologians is the absence of

theological analysis. The forty-five page report of the working party of the Catholic Bishops Joint Committee, for example, contains only five pages that are explicitly theological and the whole report contains not a single quotation from Scripture. The document of the International Theological Commission, referred to above, contains both Scriptural citation and theological analysis, but not in the paragraphs about genetic engineering. At that point the document reverts to weighing up risks and benefits. It is for this reason that these statements appear so thin, pedestrian and conventional. They add nothing theological to secular discussion of the question but seem, if anything, to draw on secular discussion. Hence they do not help people who might look to the Church for an articulation of some intrinsic problem with GGE.

The poverty of explicitly theological analysis in the Roman Catholic response to genetic engineering should be set in the broader context of the current state of Catholic moral theology. This is shaped by the Second Vatican Council (1962-1965) which had set out to reform the Church in a number of ways. In relation to moral theology, the Council, called for it to be 'nourished more on the teaching of the Bible, [it] should shed light on the loftiness of the calling of the faithful in Christ' (*Optatam totius* 16). The implicit criticism of Catholic moral theology in the time before Vatican II was made explicit in a later document. 'In the past, moral theology exhibited at times a certain narrowness of vision and some lacunas. This was due in large part to a kind of legalism, to an individualistic orientation, and to a separation from the sources of Revelation.' (*On the Formation of Future Priests*, published 22 February 1976 by the Congregation for Catholic Education n. 96 quoted by Pinckaers 1995)

If theology is 'separated from the sources of Revelation' then it is scarcely theology at all, more an exercise in philosophical thinking.[ii] This is exactly what Catholic moral theology had become, and what, despite the Council, it sometimes remains, as Richard McCormick astutely observed: 'Those who are concerned with concrete moral problems and a disciplined analysis of their solution say little about vision and character and the biblical-liturgical materials that nourish and sustain them. In other words, they act like moral philosophers' (McCormick 1981, p.295; Jones 2008, p. 80). Genetic

engineering is just such an example of the kind of concrete moral problem where the attempt at disciplined analysis has been separated from a richer theological vision.

3. Scientists playing god

While many contemporary Catholic moral theologians have contented themselves with discussions of the possible risks, benefits and harms (especially to the human embryo) of GGE, it is ironic that secular philosophers and scientists have frequently adverted to theological themes when discussing human genetics.

One common theological motif among secular writers is that the discovery of genetics will give 'god like' powers or the corollary of this, that genetic engineering and selection involve 'playing god' with the lives of future generations. A good example of the former kind is proved by James Watson, co-discoverer of the structure of DNA, 'only with the discovery of the double helix and the ensuing genetic revolution have we had grounds for thinking that the powers held traditionally to be the exclusive property of the gods might one day be ours.' (Highfield 2003) With these powers comes responsibility, but for a eugenicist like Watson, this is exercised precisely by intervening: 'I think it's irresponsible not to try and direct evolution to produce a human being who will be an asset to the world.' (Darnovsky 2007)

In 1977 the utilitarian philosopher Jonathan Glover confidently defended the view that not only abortion but also infanticide should be permitted for newborn infants with an 'abnormality' (the example he gave was spina bifida) (Glover 1977, p. 168). By 2001 he had become more cautious. Quoting a woman with spina bifida who was happy to be alive, he ponders, 'Is anyone in a position to make the Godlike judgement: "It would have been better if you had been aborted"' (Glover 2001, p. 432). The older Glover astutely notes that the ethical question here relates not only to killing (whether by abortion or infanticide) but would be present even if the disabled person's existence had been prevented by avoiding conception. 'Is anyone in a position to make the Godlike judgment: "it would have been better if you had not been conceived"?' (Glover 2001, p. 433) The answer to this rhetorical question is answered by Watson with another, 'If scientists don't play God, who will?'

(Darnovsky 2007) It is noteworthy that Watson associates godlike power to decide these issues not to all human beings in general or to society as a whole but specifically to 'scientists'.

While talk of 'playing god' is a commonplace among secular commentators it is nowhere to be found in any of the documents of the Vatican related to genetic engineering. Indeed the phrase seems never to have been used in any Papal statement or Vatican decree until 2008 when Pope Benedict used the phrase not in relation to science but to warn young people to beware 'the cult of material possessions, the cult of possessive love and the cult of power'. More significantly, it is not only that the language of 'playing god' is omitted, but also reference to the fall narrative that underlies it (Genesis 3.1-24). This is rarely if ever applied to the analysis of GGE. Such reticence is common among Catholic moral theologians who tend to emphasise rather the power God has given to human beings to use intelligence and skill in the service of medicine. So, for example, Ashley and O'Rourke (1989, p. 302-303) criticise those who 'question the extent of human dominion over nature'. In contrast they put forward two points:

1. God is a generous Creator, who in creating human beings also called them by the gift of intelligence to share in his creative power. Consequently, God does not want human beings to leave fallow the talents he has given them, but encourages them to improve on the universe he has made.
2. Such improvement is possible because theology can accept the idea that God has made an evolutionary universe in which the human race has been created through an evolutionary process that is not complete. This God has called humankind to join with him in bringing the universe to its completion, and in doing this, he has not made them mere workers to execute his orders or to add trifling original touches on their own. Rather, God has made then genuine co-workers and encourages them to exercise real creativity.

The reference to evolution and the optimistic account of progress it embodies echo (perhaps consciously) the thought of Teilhard de Chardin. In this context it is interesting to note a weakness in this theologian which is also reflected in the two theological points which ground Ashley and

O'Rourke's discussion of GGE. They lack any reference to sin or the fall. It is as though Genesis 1-2 were taken as an adequate basis for a Catholic theology of creation without the complement of Genesis 3. However, if Genesis 1.26 shows human beings as having God given dominion over the earth (and hence are 'genuine co-workers') Genesis 3.5 shows the serpent tempting Eve with the words, 'you will be like God'. There is an irony here, well recognised by Augustine that the snake promises the couple something that would have been theirs, had they not sinned. However, 'by aiming at more, a man is diminished, when he elects to be self-sufficient and defects from the one who is really sufficient for him' (*City of God* XIV.13).

A theology of creation without sufficient recognition of the fall leads to a celebration of the powers, strengths and excellences of human nature, as seen in human creativity, invention and the sciences. This theology coheres closely with Aristotle's account of the aim of human life, to cultivate the virtues so as to flourish as an individual and in society. However, Alasdair MacIntyre (1999) has shown that this Aristotelian view, and much of the subsequent Western philosophical tradition, is myopic in relation to human dependence. In contrast, at this point Thomas Aquinas differs sharply from Aristotle: for whereas Aristotle regarded dependence on others as something to be ashamed of, Thomas, (here at his most Augustinian), regarded dependence as a key feature of human life and recognition of this feature as a key Christian virtue. This is why humility is a vice for Aristotle and a virtue for Christians.

Ashley and O'Rourke (1989, p. 304) cite an early article of MacIntyre (1979) in which he argues against eugenics (this short piece in some ways anticipates his later work (1999) on *Dependent Rational Animals*), but they do not relate his argument to theology. Instead they attempt to buttress it with an appeal to the long term risks of 'polluting the gene pool with defects' by GGE, especially those defects which might affect the brains of future people and hence compromise their intelligence. However, this invocation of fear of the future is in marked contrast to MacIntyre's appeal to the virtue of humility, and the result is that the argument can easily be turned on its head. If the problem is 'polluting the gene pool' and if any 'defect' that would affect the brain would be

'disastrous', then this is a powerful prima facie reason *to* intervene to prevent the birth of intellectually-disabled children. Hence Ashley and O'Rourke both reinforce fear of intellectual disability and make the evaluation of GGE contingent on its risks over and against its effectiveness in preventing disability.

4. Unborn ghosts

The unwillingness of Magisterial documents and of Catholic theologians such as Ashley and O'Rourke to invoke the fall narrative in relation to GGE is the concomitant of their celebration of the noble human enterprises of science and medicine. The use of technical knowledge and human skill are good in themselves and GGE cannot be condemned in principle simply because it involves human intervention in nature. Nor is there a problem altering the human body, if this is for the sake of the health of the body. This is a central element of 'conventional medicine' (here simply used to mean medicine but excluding at this point GGE, so as not to beg the question as to whether GGE is medicine in a wider sense). If GGE involves a disordered desire to 'be like God' (Genesis 3.5) this can only be because there is some intrinsic difference in intention or scope that both distinguishes GGE from conventional medicine and points to the underlying ethical problem.

The distinction can perhaps be illustrated by exploring another theological issue that is raised by secular philosophers, and this relates to the problem of existence:

'The claim under consideration is that to be brought into existence with an extremely severe disability may not be in the best interest of a child. This entails a general problem of comparing existence with nonexistence. When medial techniques determine that some people rather than others come into existence, can those people be said to be better or worse off for the intervention?' (Glover 2001, p. 439)

That this question bears on theology properly speaking should be clear from a comparison on Aristotle and Thomas Aquinas. Aristotle, for all he was concerned with being qua being did not have a conception of *creatio ex nihilo*. In contrast, for Thomas Aquinas the fundamental metaphysical distinction between essence and existence was rooted not in the natural phenomenon of generation

and corruption of material beings out of or into other material beings, but in the gratuitous Divine creation of all being (McCabe 2002). Where philosophers approach the question of being head on they are forced either to deny the reality of the problem or to acknowledge a sense of mystery. ‘It is not how things are in the world that is mystical, but that it exists.’ (Wittgenstein 6.44)

In relation to the mysterious 'state of being unconceived' (Glover 2001, p. 439) there are indeed 'slippery conceptual problems’ (p. 440) as is nicely illustrated by the following quotation from Richard Dawkins:

We are going to die, and that makes us the lucky ones. Most people are never going to die because they are never going to be born. The potential people who could have been here in my place but who will in fact never see the light of day outnumber the sand grains of Arabia. Certainly those unborn ghosts include greater poets than Keats, scientists greater than Newton. We know this because the set of possible people allowed by our DNA so massively exceeds the set of actual people. In the teeth of these stupefying odds it is you and I, in our ordinariness, that are here. (Dawkins 1998, p. 1)

Dawkins ‘unborn ghosts’ are not the souls of infants who have died in the womb, the fate of which has been a cause of speculation at least since the time of Augustine. He is rather speaking of the souls of those who have never been conceived. A similar comparison of the dead to the unborn occurs in the Hebrew Scriptures, though the Preacher takes a less sanguine view of the trials of being alive, ‘And I thought the dead who are already dead more fortunate than the living who are still alive; but better than both is he who has not yet been, and has not seen the evil deeds that are done under the sun.’ (Ecclesiastes 4.2-3) If we are to make the theology here explicit we might perhaps invoke the ancient Jewish story according to which every soul that would ever live was created in the first six days of creation.

Each and every soul which shall be from Adam until the end of the world, was formed during the six days of Creation and was in paradise… At the time of conception God commands the angel who is the guardian of the spirits, saying: ‘Bring Me such a spirit which is in paradise and hath such a name

and such a form'… God says to the soul, 'the world into which you enter is more beautiful than this; and when I made you I intended you only for this drop of seed.'

(Midrash Tanhuma Pekude, 3, see Ginzberg (1909-1938) in Jones 2004, p. 96)

However, Dawkins unborn ghost are far more populous than those who 'shall be from Adam to the end of the world'. The souls of the Midrash, like those the Preacher speaks of, who have 'not yet been' are numbered according to the actual future, whereas Dawkins unborn ghosts include everyone who *could* ever live, in every possible world, which Dawkins takes to be specified by every possible genetic make-up. But then again, how can we identify these people who could have lived but who did not and will not do so? It cannot be by the sequence of their genes, because we know that identical twins are distinct persons, and if I am cloned in the future that cloned individual will not be me. The number of possible persons is larger than the number of possible gene sequences. So how can future persons be identified? In the words of a well-known logician, 'things that have existed do seem to be individually identifiable and discussable in a way in which things that don't yet exist are not (the dead are metaphysically less frightening than the unborn)' (Prior 1978, p. 171). Prior would perhaps find Dawkins unborn ghosts doubly metaphysically frightening. These are not the remains of persons who 'have existed'; they are not even persons who 'don't yet exist'; they are only persons who 'might have existed'.

The identity problem of unborn ghosts is a conceptual problem for GGE if these interventions are characterised as therapeutic. In relation to conventional therapy we can ask how an intervention benefits or harms the patient. In what ways might he or she be better off, in what ways worse off? But who is the supposed beneficiary of GGE? At this point Glover is commendably clear in seeing that the choice in GGE, and eugenics in general, is not to alleviate the condition of someone with disability, but is to choose to conceive someone without disability rather than someone with disability, i.e. to choose 'some people rather than others to come into existence' (Glover 2001, p. 439). This is a key point. If this is true, then GGE cannot be regarded as 'therapeutic' even when it targets pathological inherited conditions. Note that this point is not based on a strong link between

genetics and identity. The inability to identify people who are 'treated' by GGE is based on the theological realisation that future people have not yet been created and there is a categorical difference between ministering to people who exist and seeking to create people with certain characteristics.[iii]

This also shows why GGE is different from environmental action, public health interventions or working for posterity in a way that might benefit future generations. In all these cases it is no part of the aim that certain people and not others should come into existence. I can build a park in the hope it benefits future generations whoever they may be, but when I intervene in the germline I am seeking to affect who will be in the park.

Interestingly, the mystery of future persons causes paradoxes that are sufficiently grave to cause some utilitarians to reassess their premises. McMahan sees an impersonal utilitarian calculus as implying that 'the failure to cause a person to exist is at least as bad as killing a person' (McMahan 2001, p. 471), a conclusion he regards as 'plainly unacceptable'. Similarly, if all that mattered were total happiness, people would be 'obligated to have many children in order to increase the total happiness' (Glover 2001, p. 441; see also Parfit 1984 c. 17). To escape such repugnant conclusions, utilitarians such as Glover and McMahan argue for a 'person-affecting' utilitarianism. According to this, one's aim should be 'to make people happy not to make happy people' (Glover 2001, p. 441). In annunciating this principle, Glover seems implicitly to acknowledge the value of the actual existing person. The same point is succinctly made by Helen Watt in her critique of eugenic abortion: it is 'bizarre to see a human life as a replaceable container of pleasure, as if it is the pleasure which is morally important, while the human being is not' (Watt 2000, p. 75 citing Singer 1993, p. 186).

At this juncture, it might be argued that, if GGE were achieved by interventions on gametes, it could be regarded as therapy on the *parents*, who are certainly identifiable actual persons. Perhaps the potential to pass on defective genes could be thought of as an illness in the parent. However, this move relies on a questionable understanding of procreation. It is right for parents to plan how and when they could best welcome and rear a child, if this is itself done in a virtuous way. However, it is

wrong to think that a parent harms a child if the child inherits a condition from a parent. So equally it is wrong to hold, as eugenicists sometimes assert, that parents have a duty to conceive only healthy offspring. Rather than being a duty this seems to imply a conditional acceptance of the child which is the very contradiction of parenthood. It may of course be that therapy that benefits someone has a side-effect that it affects his or her future offspring (either for good or ill). However, the effect in GGE is not accidental. The aim is precisely to pass on healthy genes to a future child, so the intention is precisely not therapy for a parent but the health condition of the offspring, which returns us to the creation of future persons.

It might be thought that while secular utilitarians such as Glover cannot identify individuals who would benefit from GGE, this problem could be solved if appeal is made to theological principles. If God can identity future persons who benefit for GGE then it can be understood as therapeutic. In this way, while there could be no secular justification for GGE, there could be a theological justification. This assumes that God knows not only what the future actually will be, but also of what the future would have been had certain actions been taken or had other actions not been taken and therefore can identify the people who *would have* existed. Just such a doctrine of God's knowledge of 'what would have happened if...' was developed by Catholic theologians in the seventeenth century. The concept of is 'middle knowledge' (*scientia media*) was posited not to help guide moral theology but to explain the theology of grace and other problems of theodicy. The Jesuit theologian Lius de Molina, (see Pohle 1911) proposed that God gives grace to those who will use it well, and if God sometimes does not give grace, this is only because he knows that had the grace been given then in any case the person would not have used it well. Grace is always effective because God only gives it were it will be effective. A similar line of reasoning was used to explain the early deaths of children – these deaths spared the child from harm that would have come later in life.

Even from the first this system was subject to severe criticism because, while it paid lip-service to the need for God's grace, the emphasis was all on free will and God's foreknowledge. In opposition to this approach other theologians, chiefly but not exclusively from the Order of Preachers,

defended a more Augustinian reading of Thomas Aquinas according to which grace was given freely by God and not in accordance to foreseen merits. Eventually a Papal commission was formed to adjudicate the dispute (*Congregatio de Auxiliis*). It refused to condemn either party. Nevertheless, in its historical context, Molinism can be seen as symptomatic of the rationalism that characterised that era of Catholic theology. The doctrine of *scientia media* was a theological construct nicely designed to justify the actions of God. However, the knowledge it posited in God was a fancy without any determinate cause either in the actual future or the actual possibilities of the present. In the words of the philosopher Elizabeth Anscombe, 'there [is] not, quite generally, any such thing as what would have happened if what did happen had not happened, and that in particular there [is] no such thing as what someone would have done if… and certainly that there [is] no such thing as how someone would have spent his life if he had not died as a child.' (Anscombe 1983, p. vii) The history of Molinism thus provides a theological *reduction ad absurdum* for the view that GGE is therapeutic because God can identify the 'would have been disabled' persons who would benefit. There are no such 'would have been' persons because there are no definite set of identifiable persons that God 'would have created'.

A preliminary theological analysis suggests that GGE is 'playing god' precisely because it involves a use of power not to help actual persons in need but to create or select future persons of a particular kind. Such an attempt itself involves some 'eugenic' determination of the worthwhileness of the lives of future persons, based on their genetic characteristics. It is this feature of eugenics, the intention to improve or purify the human genetic stock, that is the root of its viciousness. G.K. Chesterton famously compared eugenics to witch-burning. He remarked that he was not sceptical of the existence of witches, but he was sceptical of witch-finders. The attempt to eradicate an evil 'degenerated into a rabid and despicable persecution of the feeble or the old. It ended by being a war upon the weak.' (Chesterton 1922, p. 64) The same can be said of eugenics. There is suffering in disability but eugenics represents an attempt to eradicate this evil by eliminating disabled people, and this inevitably brings forth persecution. If eugenics has historically given rise to many other evils,

discrimination, compulsory sterilisation, discarding of human embryos, killing of born and unborn infants, it must be asked whether these are accidental features, or rather, symptomatic of a deeper problem. In the words of Jesus, 'the tree is known by its fruit' (Matthew 12.22). Germ-line genetic engineering is thus theologically problematic because of the intention it embodies.

5. Human identity, procreation, and the need for further theological analysis

The analysis given here is not dependent on a strong link between genotype and personal identity. Even without demonstrating such a link, one can recognise that GGE is not an attempt at therapy but an attempt to 'play god' by determining the qualities of future persons. Nevertheless, the question of personal identity is also significant and calls for further theological analysis. Human beings derive their individual identity at least in part from the circumstances and conditions of their origin. From a theological perspective this identity of origin is an expression of God's act of creation. It is God who creates the human person and fashions him or her in the womb. It is God who creates the soul of that person when the human being is conceived. Human conception is most commonly from a fusion of two gametes each contributing to the new and unique genotype.[iv] Furthermore, as well as representing what is individual in each person, the human genome also represents what is common to all human beings, a shared inheritance. This also connects to a profound theological theme, the unity of the human family in Adam and in Christ as sharing a common nature and ultimate end.

One possible theological defence of GGE is that it is not therapy of an individual but therapy of human nature, just as Christ therapized human nature.[v] However, this comparison shows even more vividly how GGE represents an attempt to play god, for it is surely only God who creates human nature and only God who can heal that nature. It is this attempt to reshape humanity itself, implicit in GGE, which has caused the unease among the nations.

The recent scientific proposal that nonhuman genes be inserted into human embryos sharpens the issue of human identity, for what is at stake is not only personal identity but species identity. In this context Nicholas Tonti-Filippini has argued that the introduction even of a single gene threatens human identity. Certainly GGE with non-human genes represents a radical affront to our shared

humanity. This could be characterised as the 'sacredness' of the human genome but it is perhaps better understood as the sacredness of a process, the process of procreation whereby this shared humanity is passed on. Introducing nonhuman genes into human beings is *'an offense against the sacredness of the generative faculty that subsists in the human genome*' (Tonti-Filippini 2006, 703). The theology of the genome should thus be related to the theology of procreation, the unity of man and woman as one flesh, the theology of the body and the theology of marriage. Understood in this way, GGE is problematic because the plan to have children of such and such a kind represents a very different relationship of parent to child than that understood by a Catholic view of marriage and procreation. It represents not an attempt to create a good environment to nurture a child, but an attempt to determine the identity or nature of the child. This direct manipulation of the genetic identity of the child-to-be is unaccepting of the child as gift: GGE embodies a desire for control that one might call 'non-conjugal' or 'non-procreative'. Thus even if GGE could be achieved without resort to IVF, it retains the same desire for control, that same reduction of procreation to reproduction, that is found in IVF.

Conclusion

It has been argued here that contemporary Magisterial Catholic discussions of germ-line genetic engineering add little to secular accounts. Discussions of this issue seem to exemplify a weakness in contemporary Roman Catholic moral theology more generally. In contrast secular discussion of GGE itself raises theological questions. This article has drawn out some theological themes that suggest the presence of an intrinsic ethical objection to GGE, even were it to be safe, even were it not to involve IVF, and even were it confined to inherited conditions which were pathological. There seems to be a deeper theological problem. Nevertheless, the aim of this article is not to foreclose discussion but rather to demonstrate the pressing need for further *theological* analysis of GGE within the Catholic moral tradition so that official Magisterial teaching on the question can be better informed. This is a great undertaking which has hardly begun.

Bibliography

Andorno, R. (2002) Biomedicine and international human rights law: in search of a global consensus. *Bulletin of the World Health Organization,* 80 (12) 959-963.

Annas, G.J., Andrews, L.B., and Isasi, R.M. (2002) Protesting the Endangered Human: Toward an International Treaty Prohibiting Cloning and Inheritable Alterations. *American Journal of Law and Medicine* 28, 151-178.

Ashley, B.M. and O'Rourke, K.D. (1989) *Healthcare Ethics: A Theological Analysis* St Louis: CHA Publishing.

Anscombe, G.E.M. (1983) *Metaphysics and the Philosophy of Mind* Oxford: Blackwell.

G.K. Chesterton, G.K. (1922) *Eugenics and other evils*. London: Casell. Available: http://www.gutenberg.org/files/25308/25308-h/25308-h.htm

Darnovsky, M. Still Unnoticed: James Watson's Eugenic Enthusiasms. [On-line]. *Centre for Genetics and Society* Press Release October 22nd, 2007. Available: http://www.geneticsandsociety.org/article.php?id=3725

Dawkins, R. (1998) *Unweaving the Rainbow: Science, Delusion and the Appetite for Wonder* Boston: Houghton Mifflin.

Delaney, J.J. (2009) The Catholic Position on Germ Line Genetic Engineering. *The American Journal of Bioethics* 9.11, 33-34.

Glover, J. (2001) Future People: Disability, and Screening. in Harris, J. (Ed.) *Bioethics* Oxford: OUP.

Glover, J. (1977) *Causing death saving lives* Harmondsworth: Penguin.

Highfield, R. Do our genes reveal the hand of God? *Telegraph* 20 March 2003. Available: http://www.telegraph.co.uk/science/science-news/3306329/Do-our-genes-reveal-the-hand-of-God.html

Institute on Biotechnology and the Human Future *National Legislation concerning Human Cloning and Germline Manipulation*. [On-line]. Available: http://www.thehumanfuture.org/documents/Intl_Legis_clon_germline_text.pdf

Jones, D.A. (2004)*The Soul of the Embryo: An enquiry into the status of the human embryo in the Christian tradition* London: Continuum.

Jones, D.A. (2008) John Paul II and Moral Theology in O'Collins, G. and Hayes, M. (Eds.) *The Legacy of Pope John Paul II* London: Continuum.

McMahan, J. (2001) Wrongful Life: Paradoxes in the Morality of Causing people to Exist in Harris, J. (Ed.) *Bioethics* Oxford: OUP.

McCormick, R. (1981) Scripture, Liturgy, Character, and Morality. Reprinted in Curran, C. and McCormick, R. (Eds.) (1984) *Moral Theology No. 4: The Use of Scripture in Moral theology* New York: Paulist Press, pp. 289-302.

MacIntyre, A. (1979) Seven Traits for Designing Our Descendents. *Hastings Center Report* 9, 5-17.

MacIntyre, A. (1999) *Dependent Rational Animals* Chicago: Open Court.

McCabe, H. (2002) The Logic of Mysticism in McCabe, H. *God Still Matters* London: Continuum.

Parfit, D. (1984) *Reasons and Persons* Oxford: OUP.

Pinckaers, S. (1995) The Use of Scripture and the Renewal of Moral Theology: the *Catechism* and *Veritatis Splendor*. *The Thomist* 59,1-19.

Pohle, J. (1911) Molinism. *The Catholic Encyclopedia* Vol. 10. New York: Robert Appleton Company. Available: <http://www.newadvent.org/cathen/10437a.htm>

Prior A.N. (1978) *Past, present and Future.* Oxford: Clarendon Press.

Singer, P. (1993) *Practical Ethics*. Cambridge: CUP.

Tonti-Filippini, N. et al. (2006) Ethics and Human-animal Transgenesis. *National Catholic Bioethics Quarterly* 6(4), 689-704.

Watt, H. (2000) *Life and Death in Healthcare Ethics* London and New York: Routledge.

Wittgenstein, L. *Tractatus Logico-Philosophicus*.

Magisterial and Theological Documents

Catechism of the Catholic Church [On-line]. Available: http://www.vatican.va/archive/catechism/ccc_toc.htm

Dignitas Personae [On-line] Available:

http://www.vatican.va/roman_curia/congregations/cfaith/documents/rc_con_cfaith_doc_20081208_dignitas-personae_en.html

Donum Vitae [On-line] Available:

http://www.vatican.va/roman_curia/congregations/cfaith/documents/rc_con_cfaith_doc_19870222_respect-for-human-life_en.html

International Association of Catholic Bioethics. (Summer 2008) Statement on Regenerative Medicine and Stem Cell Research *National Catholic Bioethics Quarterly* 8.2 322-39.

International Theological Commission, *Communion and Stewardship: Human Persons Created in the Image of God* [On-line] Available:

http://www.vatican.va/roman_curia/congregations/cfaith/cti_documents/rc_con_cfaith_doc_20040723_communion-stewardship_en.html

Observations on the Universal Declaration on the Human Genome and Human Rights (Paris, 11 November 1997) [On-line] Available:

http://www.vatican.va/roman_curia/pontifical_academies/acdlife/documents/rc_pa_acdlife_doc_08111998_genoma_en.html

Congregation for Catholic Education. (1976) *On the Formation of Future Priests* Published 22 February 1976.

Optatam totius (Vatican II) (1965) [On-Line] Available:

http://www.vatican.va/archive/hist_councils/ii_vatican_council/documents/vat-ii_decree_19651028_optatam-totius_en.html

The Report of a Working Party, The Catholic Bishop's Joint Committee on Bioethical Issues (1996) *Genetic Intervention on Human Subjects* London: The Catholic Bishops' Joint Committee on Bioethical Issues.

Veritatis Splendor (1993) [On-line] Available:

http://www.vatican.va/holy_father/john_paul_ii/encyclicals/documents/hf_jp-ii_enc_06081993_veritatis-splendor_en.html

---

[i] Catholic teaching on the body and the principles related to human life and human sexuality could, of course, provide a rich theological basis for an analysis of GGE. The point being made is only that thus far the documents of the Magisterium that deal explicitly with GGE do not show the same depth of theological reflection as those dealing with, for example, human life or sexuality.

[ii] As the understanding of 'the sources of Revelation' also suffers if Scripture and Tradition are 'separated from' dogmatic theology or from the Magisterium.

[iii] Parfit (1984, p. 355) argues that 'On all of the plausible views…You were conceived at a certain time. It is in fact true that, if you had not been conceived within a month of that time, you would not have existed.' This illustrates how dependent identity is on contingent circumstances, but our point is a more radical theological one, that God creates identity.

[iv] The exception to this rule is the conception of identical twins not by fusion but by fission. So it is not strictly necessary for personal identity that a genotype is unique. Nevertheless each person has a genotype which is properly his or hers and which that person has from the first moment of his or her existence.

[v] I am indebted to Corinna Delkeskamp-Hayes for this example.